APPENDIX G

WEATHER EFFECTS ON ENGINEERS

Engineer operations are influenced by past, current and future weather conditions. The interaction of weather with terrain produces a greater impact on engineer operations than previously understood. A source of help in identifying weather and terrain impacts is the terrain analyst team at division. Below are some weather effects on engineer operations that are not contained in the WTDA tables.

CLOUDS AND SKY COVER. Low clouds can limit the effectiveness of aerial illumination devices.

FREEZE AND THAW DEPTH. The frost line impacts site selection, construction, excavation, and trafficability.

HUMIDITY. Extreme humidities affect handling, storage, and use of building materials. When coupled with high temperatures, humidity affects personnel and significantly increases the time to perform physical work.

ILLUMINATION. Optimum use of most NVD requires about a quarter (23 percent) of the moon, 30 degrees above the horizon, scattered clouds, and the sun more than 15 degrees below the horizon. See Appendix F for further information on E-O devices.

PRECIPITATION. High rainfall rates influence river currents, water depth, and bridging operations. It complicates other construction or maintenance jobs, affects flooding, river-crossings, soil bearing strength, and explosives.

SNOW DEPTH. Snow affects site selection, construction, and flood prediction.

STATE-OF-THE-GROUND. Ground conditions impact mining operations, trenching, and any excavation job. Snow cover can impact the emplacement of scatterable mines.

SURFACE WINDS. Ground level winds affect river crossings, port management, and all watercraft. Construction projects in chronic wind areas may need to recalculate structural strength figures.

TEMPERATURE. High temperatures impact trafficability, influence flood control, and dictate the use of certain construction materials. Cold weather influences ice thickness and river crossings, Ice flow problems affect bridges. For example, armored vehicle launched bridges (AVLBs) are affected by warming if they were set up on frozen ground. Alternating freezing and thawing (frost heaves) may destroy the effectiveness of emplaced mines.

THUNDERSTORM AND LIGHTNING. Electrical storms, and the associated rain and wind, affect electronic systems in general and antennas, shelters, and mobility in particular.

SEA STATE. This condition affects site selection and the operations of port and beach facilities.

Table G-1. Weather effects from cloud ceiling.

WEATHER VALUE (FEET)	SEVERE DEGRADATION		MODERATE DEGRADATION	
	SYSTEM/EVENT	REMARKS	SYSTEM/EVENT	REMARKS
LT 1,000			Army aviation	See app E

Table G-2. Weather effects from reduced visibility.

WEATHER VALUE (METERS)	SEVERE DEGRADATION		MODERATE DEGRADATION	
	SYSTEM/EVENT	REMARKS	SYSTEM/EVENT	REMARKS
LT 150			River crossings	Reduced speed

Table G-3. Weather effects from surface winds.

WEATHER VALUE (KNOTS)	SEVERE DEGRADATION		MODERATE DEGRADATION	
	SYSTEM/EVENT	REMARKS	SYSTEM/EVENT	REMARKS
GT 7			GSR	Increased noise
GT 20	GSR	Increased noise	Communications antennas River crossings Crane operations	 Reduced speed Increases fuel consumption, reduces lift
GT 25			Personnel	
GT 30	Crane operations	Terminates		
GT 35	Medium girder bridge		Float bridging	Waves
GT 40	Personnel			
GT 50	Communications antennas			

Table G-4. Weather effects from temperature.

WEATHER VALUE (°F/°C)	SEVERE DEGRADATION		MODERATE DEGRADATION	
	SYSTEM/EVENT	REMARKS	SYSTEM/EVENT	REMARKS
LT -25/-32	Dry cell battery Personnel	Only 20% effective	Generators Mine detectors	wo Arctic kit wo Arctic kit, short battery life
LT -20/-28			Maintenance	Takes five times longer
LT 0/-18			Wheeled vehicles Dry cell battery Military explosives	wo winter kit Only 40% effective
LT 32/0			Personnel	See app L for wind-chill
GT 85/29			Personnel	See app L for temp/ humidity index
GT 95/35	Personnel	See app L for water consumption	Dry cell battery	Won't hold charge
GT 125/52	Generator-type blasting machines Demolition kits Mine detectors Generators			

Table G-5. Weather effects from precipitation.

WEATHER CONDITION	SEVERE DEGRADATION		MODERATE DEGRADATION	
	SYSTEM/EVENT	REMARKS	SYSTEM/EVENT	REMARKS
Light rain or snow			Mortar operations Wheeled vehicles Target acquisition	Sight glass fogs
Moderate rain or snow			LOS communications Personnel movement Ground emplaced mines scattering system Target acquisition Equipment storage Wheeled vehicles	
Heavy rain or snow	Mortar operations Mines (snow) Personnel movement LOS communications Target acquisition Construction/bridging	Sight glass fogs up	Mines	Rain
Thunder-storm/ lightning			Ammunition Aircraft Refueling Communications Equipment storage	Safety Interference
Light freezing rain			Personnel Wheeled vehicles	
Moderate freezing rain	Personnel Wheeled vehicles			
SNOW DEPTH (INCHES)				
GT 3			Personnel movement Mines	
GT 6	Personnel movement Mines		20-mm and 40-mm ammunition Wheeled vehicles	
GT 12	Wheeled vehicles			
GT 20			Tracked vehicles	
GT 30	Tracked vehicles			